PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appellants:	Paul St. John Brittan *et al.*	On Appeal to the Board of Appeals
Serial No.:	10/607,577	Art Unit.: 2626
Filed:	June 25, 2003	Examiner: Wozniak, James S.
For:	"Dynamic Control of Resource Usage in a Multimodal System"	Our Ref: B-5134 621037-8
		Date: February 4, 2008

Re: *Brief on Appeal*

BRIEF ON APPEAL

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This is an appeal from the Final Action, dated September 7, 2007, for the above identified patent application. Appellants submit that this Appeal Brief is being timely filed before the final deadline of February 7, 2008. Please charge the Appeal Brief fee of $510 to deposit account no. 08-2025.

REAL PARTY IN INTEREST

The real party in interest to the present application is Hewlett-Packard Development Company, LP, a limited partnership established under the laws of

the State of Texas and having a principal place of business at 20555 S.H. 249 Houston, TX 77070, U.S.A. (hereinafter "HPDC"). HPDC is a Texas limited partnership and is a wholly-owned affiliate of Hewlett-Packard Company, a Delaware Corporation, headquartered in Palo Alto, CA. The general or managing partner of HPDC is HPQ Holdings, LLC.

RELATED APPEALS AND INTERFERENCES

Appellants submit that there are no other prior and pending appeals, interferences or judicial proceedings which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

STATUS OF CLAIMS

Claims 1-20 are currently pending. Claims 1-20 stand rejected and are the subject of this Appeal and are reproduced in the accompanying Claims Appendix.

STATUS OF AMENDMENTS

No Amendment After Final Rejection has been entered.

SUMMARY OF CLAIMED SUBJECT MATTER

The invention described and claimed in the present application relates to dynamic control of resource usage in a multimodal system.

The present invention teaches a method of dynamically controlling usage of a resource by task entities respectively involved in processing different input

modalities, wherein the relative average actual or allocated usage of the resource by the task entities is dynamically adjusted according to one or more of the following: actual usage of the different modalities by a user; confidence in the results of processing of each of the modalities; pragmatic information on mode usage. Pragmatic information on mode usage provides a measure of how the target application is set up to use input from different modes--in other words, whether input from one modality is more important or useful than that from another modality, at least in the current application context (Page 2, line 30 – Page 3, line 9).

Claim 1 of the present invention is directed to a method of dynamically controlling usage of a resource by data-processing entities [65, 66, 67, 68 of FIG. 2] of a multimodal system that is arranged to receive user input in multiple input modalities for use in combination by an application being run by the multimodal system, the data-processing entities being involved in processing different input modalities in a data-processing device, the method comprising: receiving inputs regarding: input mode usage [71] by a user of the data processing device, modal requirements [71] of a dialogue manager and an application or service, and/or confidence in a recognition process [71] for each modality [input to 65, input to 67 of FIG. 2] at a bandwidth moderator [70]; determining a target relative usage of a data-processing resource; wherein a relative average actual or allocated usage of the resource by the data-processing entities is dynamically allocated by said bandwidth moderator [70] according to one or more of the following:

actual usage of the different input modalities [First Modality, Second Modality, FIG. 2] by the user of the device;

confidence in the results of processing carried out in respect of each of the input modalities;

pragmatic [62 of FIG. 2, 30 of FIG.3] information on input modality usage; and

processing at least one of the input modalities using the resource as dynamically allocated by said bandwidth moderator [70].

Claim 10 of the present invention is directed to a multimodal system comprising: one or more processors for running application software; input apparatus for receiving user inputs in multiple different input modalities [Speech, Gestures] for use by said application software; data-processing entities [65, 66, 67, 68 of FIG. 2] respectively involved in processing data in respect of different input modalities; a limited resource arranged to be used by the data-processing entities; and a moderator [70] for dynamically adjusting a relative average actual or allocated usage of the resource by the data-processing entities in dependence on one or more of the following:

actual usage of the different input modalities by a user;

confidence in the results of processing carried out in respect of each of the input modalities;

pragmatic [62 of FIG. 2, 30 of FIG.3] information on input modality usage.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Issue 1: Whether claims 1, 3, 9-10, 12, and 18-20 are patentable under 35 U.S.C. § 103(a) over Maes *et al.*, *U.S. Patent No. 6,964,023*, (hereinafter, Maes) in view of Suhm *et al.*, "*Multimodal Error Correction for Speech User Interfaces*, *2001*," (hereinafter, Suhm)?

Issue 2: Whether claims 2, 4-8, 11, and 13-17 are patentable under 35 U.S.C. § 103(a) over Maes in view of Suhm and further in view of Bridger *et al.* (WO 01/35575 A2) (hereinafter, Bridger)?

ARGUMENT

Issue 1: Whether claims 1, 3, 9-10, 12, and 18-20 are patentable under 35 U.S.C. § 103(a) over Maes *et al.*, *U.S. Patent No. 6,964,023*, (hereinafter, Maes) in view of Suhm *et al.*, "*Multimodal Error Correction for Speech User Interfaces*, *2001*," (hereinafter, Suhm)?

In the final Office Action of September 7, 2007, the Examiner rejects Claims 1, 3, 9-10, 12, and 18-20 under 35 U.S.C. 102(e) as being unpatentable over Maes in view of Suhm. Appellants respectfully disagree with the Examiner's rejection and request that the rejection be overturned on appeal.

Maes teaches systems and methods provided for performing focus detection, referential ambiguity resolution and mood classification in accordance with multi-modal input data, in varying operating conditions, in order to provide an

effective conversational computing environment for one or more users. (Maes Abstract).

The Suhm article teaches two approaches to make correction by repetition effective: switching modality for repetitions and correlating the correction input with repair context . In cross-modal repair, the user corrects with a different modality than used for the primary input. (Please see page 68, first full paragraph).

On page 5 of the Action, the Examiner states, "receiving inputs regarding: input mode usage by a user of the data processing device, modal requirements of a dialogue manager and an application or service, and/or confidence in a recognition process for each modality at a bandwidth moderator" of Appellants' claim 1 is disclosed by Maes in that the conversational resource manager receives inputs regarding engaged input modalities and associated dialog applications, modality capabilities/states, and network path delay.

However, Maes does not disclose a bandwidth moderator. Maes discloses "bandwidth" merely in the context of describing an acoustic front-end as in "Frames are advanced every 10 msec to obtain succeeding acoustic vectors. Note that other acoustic front-ends with other frame sizes and sampling rates/signal bandwidths can also be employed" (Column 12, lines 9-11, of Maes). There is no teaching in Maes of "receiving inputs regarding: input mode usage by a user of the data processing device, modal requirements of a dialogue manager and an application or service, and/or confidence in a recognition process for each modality at a bandwidth moderator" as recited in claim 1 and "a moderator for dynamically adjusting a relative average actual or allocated usage of the

resource by the data-processing entities..." as recited in claim 10.

It is noteworthy that in rejecting certain dependent claims, on page 7 of the Action, lines 6-7, the Examiner states, "Maes in view of Suhm does not explicitly suggest resources comprising communication bandwidth and memory." This further reinforces Appellants' position that Maes does not teach "receiving inputs regarding: input mode usage by a user of the data processing device, modal requirements of a dialogue manager and an application or service, and/or confidence in a recognition process for each modality at a bandwidth moderator" as recited in claim 1 and "a moderator for dynamically adjusting a relative average actual or allocated usage of the resource by the data-processing entities in dependence on one or more of the following..." as recited in claim 10.

Further, the examiner concedes that Maes does not specifically suggest receiving a confidence score in a recognition process for resource allocation (last paragraph, page 5 of the Action), and cites Suhm as reciting using confidence scores to identify recognition errors. However, in addition to Suhm's teaching neither "receiving inputs regarding: input mode usage by a user of the data processing device, modal requirements of a dialogue manager and an application or service, and/or confidence in a recognition process for each modality at a bandwidth moderator," as recited in claim 1, nor "a moderator for dynamically adjusting a relative average actual or allocated usage of the resource by the data-processing entities in dependence on one or more of the following..." as recited in claim 10, Suhm teaches away from the invention because Suhm questions whether confidence scores can facilitate error correction:

> Words with low confidence scores are tagged as possible recognition errors. Since confidence scores themselves are not reliable, these tags may be incorrect. (Emphasis added), (Last paragraph beginning on page 74, of Suhm).
>
> In addition, this study investigated the important question of whether system-initiated error detection can improve dictation performance. Our results question the common belief (among many researchers in the speech recognition community) that confidence scores can facilitate error detection. While this result is limited to the present implementation of confidence scores, anecdotal comments suggest that other implementations by developers of commercial dictation systems have failed to realize a gain as well. (Emphasis added), (Last paragraph beginning on page 94, of Suhm).

Accordingly, the significant gap left by Maes is not bridged by Suhm. Therefore, Appellants respectfully submit that independent claims 1 and 10 are patentably unobvious over Maes in view of Suhm. Appellants request that the rejection be reversed on appeal.

Claims 3, 9, and 19 depend from claim 1 and, therefore, are patentably unobvious at least for the reasons stated above. Claims 12, 18, and 20 depend from claim 1 and, therefore, are patentably unobvious at least for the reasons stated above. Appellants request that their rejection be reversed on appeal.

Issue 2: Whether claims 2, 4-8, 11, and 13-17 are patentable under 35 U.S.C. §

103(a) over Maes in view of Suhm and further in view of Bridger *et al.* (WO 01/35575 A2) (hereinafter, Bridger)?

In the final Office Action of September 7, 2007, the Examiner rejects claims 2, 4-8, 11, and 13-17, as being unpatentable over Maes in view of Suhm and further in view of Bridger. Appellants respectfully disagree with the Examiner's rejection and request that the rejection be overturned on appeal.

Bridger is nothing more than a channel router. It is not concerned with "a multimodal system that is arranged to receive user input in multiple input modalities for use in combination by an application being run by the multimodal system" as set forth in claim 1, for example.

Anyway, even if it were obvious to stuff Bridger's channel router into Maes' hardware, the limitation underlined in the preceding section is not met by the cited art.

Claims 2, and 4-8 depend from claim 1, and claims 11, and 13-17, depend from claim 10. Therefore, these claims are patentably unobvious at least for the reasons stated above. Appellants request that their rejection be reversed on appeal.

CONCLUSION

For the reasons advanced above, Appellants respectfully contend that each claim is patentable. Therefore, reversal of all rejections is courteously solicited.

The Commissioner is authorized to charge any additional fees, which may be required or credit overpayment to deposit account no. 12-0415. In particular, if this response is not timely filed, then the Commissioner is authorized to treat this response as including a petition to extend the time period pursuant to 37 CFR § 1.136 (a) requesting an extension of time of the number of months necessary to make this response timely filed and the petition fee due in connection therewith may be charged to deposit account no. 12-0415.

I hereby certify that this correspondence is being transmitted to the United States Patent and Trademark Office via electronic filing on

February 4, 2008
(Date of Transmittance)

Krista Celentano
(Name of Person Transmitting)

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1. A method of dynamically controlling usage of a resource by data-processing entities of a multimodal system that is arranged to receive user input in multiple input modalities for use in combination by an application being run by the multimodal system, the data-processing entities being involved in processing different input modalities in a data-processing device, the method comprising:

receiving inputs regarding: input mode usage by a user of the data processing device, modal requirements of a dialogue manager and an application or service, and/or confidence in a recognition process for each modality at a bandwidth moderator;

determining a target relative usage of a data-processing resource;

wherein a relative average actual or allocated usage of the resource by the data-processing entities is dynamically allocated by said bandwidth moderator according to one or more of the following:

actual usage of the different input modalities by a the user of the device;

confidence in the results of processing carried out in respect of each of the input modalities;

pragmatic information on input modality usage; and

processing at least one of the input modalities using the resource as dynamically allocated by said bandwidth moderator.

2. A method according to claim 1, wherein the resource is communication

bandwidth.

3. A method according to claim 1, wherein the resource is processing power.

4. A method according to claim 1, wherein the resource is memory.

5. A method according to claim 1 applied to each of two separate resources each used by different respective entities of said different input modalities, the adjustment of the relative usage by the different modalities of the two resources being independent of each other.

6. A method according to claim 1 applied to each of two separate resources each used by different respective entities of said different input modalities, the adjustment of the relative usage by the different modalities of the two resources being jointly controlled.

7. A method according to claim 1, wherein said resource is used by multiple data-processing entities for each modality, the relative usage of the resource being first adjusted between modalities and then between data-processing entities in the same modality.

8. A method according to claim 1, wherein said resource is used by multiple data-processing entities for each modality, the relative usage of the resource being first adjusted between different groups of equivalent data-processing

entities of different modalities and then between data-processing entities of the same group.

9. A method according to claim 1, wherein adjustment of the relative usage of the resource allocation is effected by one of: controlling operation of the data-processing entities to adjust their output to the resource; controlling the flow of output from the data-processing entities to the resource; controlling the allocation of the resource between the data-processing entities.

10. A multimodal system comprising;

one or more processors for running application software;

input apparatus for receiving user inputs in multiple different input modalities for use by said application software;

data-processing entities respectively involved in processing data in respect of different input modalities;

a limited resource arranged to be used by the data-processing entities; and

a moderator for dynamically adjusting a relative average actual or allocated usage of the resource by the data-processing entities in dependence on one or more of the following:

actual usage of the different input modalities by a user;

confidence in the results of processing carried out in respect of each of the input modalities;

pragmatic information on input modality usage.

11. A system according to claim 10, further comprising a respective additional data-processing entity associated with each said input modality, and a communications system arranged to intercommunicate the data-processing entities associated with the same input modality; said limited resource being communication bandwidth provided by said communications system.

12. A system according to claim 10, wherein the data-processing entities comprise a shared processing system and said limited resource is the processing power provided by this processing system.

13. A system according to claim 10, wherein the data-processing entities comprise a shared memory unit and said limited resource is the memory provided by the memory unit.

14. A system according to claim 10, further comprising further data-processing entities involved in processing respective ones of said input modalities, a further limited resource arranged to be used by said further data-processing entities, and a further moderator for dynamically adjusting the relative average actual or allocated usage of the resource by the further data-processing entities; the operation of the two moderators being independent of each other.

15. A system according to claim 10, further comprising further data-processing entities involved in processing respective ones of said input modalities, a further

limited resource arranged to be used by said further data-processing entities, and a further moderator for dynamically adjusting the relative average actual or allocated usage of the resource by the further data-processing entities; the moderators being arranged to operate in a coordinated manner.

16. A system according to claim 10, further comprising further data-processing entities involved in processing respective ones of said input modalities, the further data-processing entities also being arranged to use said resource and the moderator being arranged first to adjust relative usage of said resource between modalities and then between data-processing entities in the same modality.

17. A system according to claim 10, further comprising further data-processing entities involved in processing respective ones of said input modalities, the further data-processing entities also being arranged to use said resource and the moderator being arranged first to adjust relative usage of said resource between different groups of equivalent data-processing entities of different modalities and then between data-processing entities of the same group.

18. A system according to claim 10, wherein the moderator is arranged to effect adjustment of the relative usage of the resource by one of: controlling operation of the data-processing entities to adjust their output to the resource; controlling the flow of output from the data-processing entities to the resource; controlling the allocation of the resource between the data-processing entities.

19. A method according to claim 1 wherein the relative average actual or allocated usage of the resource by the data-processing entities is dynamically allocated by said bandwidth moderator according all of the following:

(i) actual usage of the different input modalities by the user of the device;

(ii) confidence in the results of processing carried out in respect of each of the input modalities;

(iii) pragmatic information on input modality usage,

but wherein only one of the three items (i) to (iii) need exist for dynamic allocation of the resource to occur.

20. A system according to claim 10 wherein the relative average actual or allocated usage of the resource by the data-processing entities is dynamically allocated by said moderator according all of the following:

(i) actual usage of the different input modalities by the user of the device;

(ii) confidence in the results of processing carried out in respect of each of the input modalities;

(iii) pragmatic information on input modality usage,

but wherein only one of the three items (i) to (iii) need exist for dynamic allocation of the resource to occur.

Evidence Appendix

No evidence is being submitted.

Related Proceedings Appendix

No copies of decisions rendered in related proceedings are being submitted.